Exhibit 7

3505-8

Michael Dorn's Report of Opinions

Concerning:

San Francisco Unified School District, California

v.

JUUL Labs, Inc. et al.

No. 3:19-cv-08177 (MDL No. 3:19-md-02913-WHO)

January 28, 2022

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Michael Dorn

HIGHLY CONFIDENTIAL

Like schools across the country, SFUSD had succeeded in reducing the use of combustible cigarettes among its students. According to the District's High School Health surveys and Middle School Health surveys, the ten-year trend on students smoking combustible cigarettes has decreased significantly, as shown in the charts below.[63] Those achievements came with years of sustained effort in multiple areas, including student and parent education, community involvement, media literacy, and extensive support programs development.

High School:

▸ SFUSD HS: Trends Over the Past 10 Years

	2009	2011	2013	2015	2017	2019	10-Year Trend
% Who smoked cigarettes on at least 1 day during the 30 days before the survey							
SF HS	10.4	10.7	7.5	5.4	4.7	6.5	Decreased ↘

Middle School:

▸ SFUSD MS: Trends Over the Past 10 Years

	2009	2011	2013	2015	2017	2019	10-Year Trend
% Who smoked cigarettes on at least 1 day during the 30 days before the survey							Decreased ↘
SF MS	4.7	3.4	2.1	1.8	0.7	1.0	
% Who ever tried cigarette smoking							Decreased ↘
SF MS	15.7	13.8	8.4	8.7	6.9	4.8	

Although likely around in some form or fashion previously, e-cigarettes first appear to have gained attention as an unhealthy trend among SFUSD students around 2013. However, indications are that although it was a trend worth noticing and addressing appropriately, e-cigarette or vapor product usage in 2013 and the next few years was low compared to more recent years. Ms. Quarry Pak, a near-20-year veteran of SFUSD who is highly experienced in health education, particularly in the area of tobacco prevention and support,[64] testified that for 2014 and 2015, SFUSD had "little to none" and "very few" student discipline incidents relating to e-cigarettes.[65] Beginning in the 2017-2018 school year, requests started pouring in to the SFUSD Central Office from principals, nurses, and social workers for "[i]nformation about training, education, policies, what they should do with the [e-cigarette] products,

[63] SFUSD_000182; SFUSD_000202.
[64] Deposition of Quarry Pak, 4/8/2021, Exhibit 2.
[65] Deposition of Quarry Pak, 10/7/2021, pgs. 125-26.

because they didn't know what to do with it."[66] In fact, according to YRBS surveys for SFUSD, the percentage of SFUSD students that reported being current- or ever-users of e-cigarettes grew significantly from 2017 to 2019, the time in which JUUL product sales grew exponentially.[67]

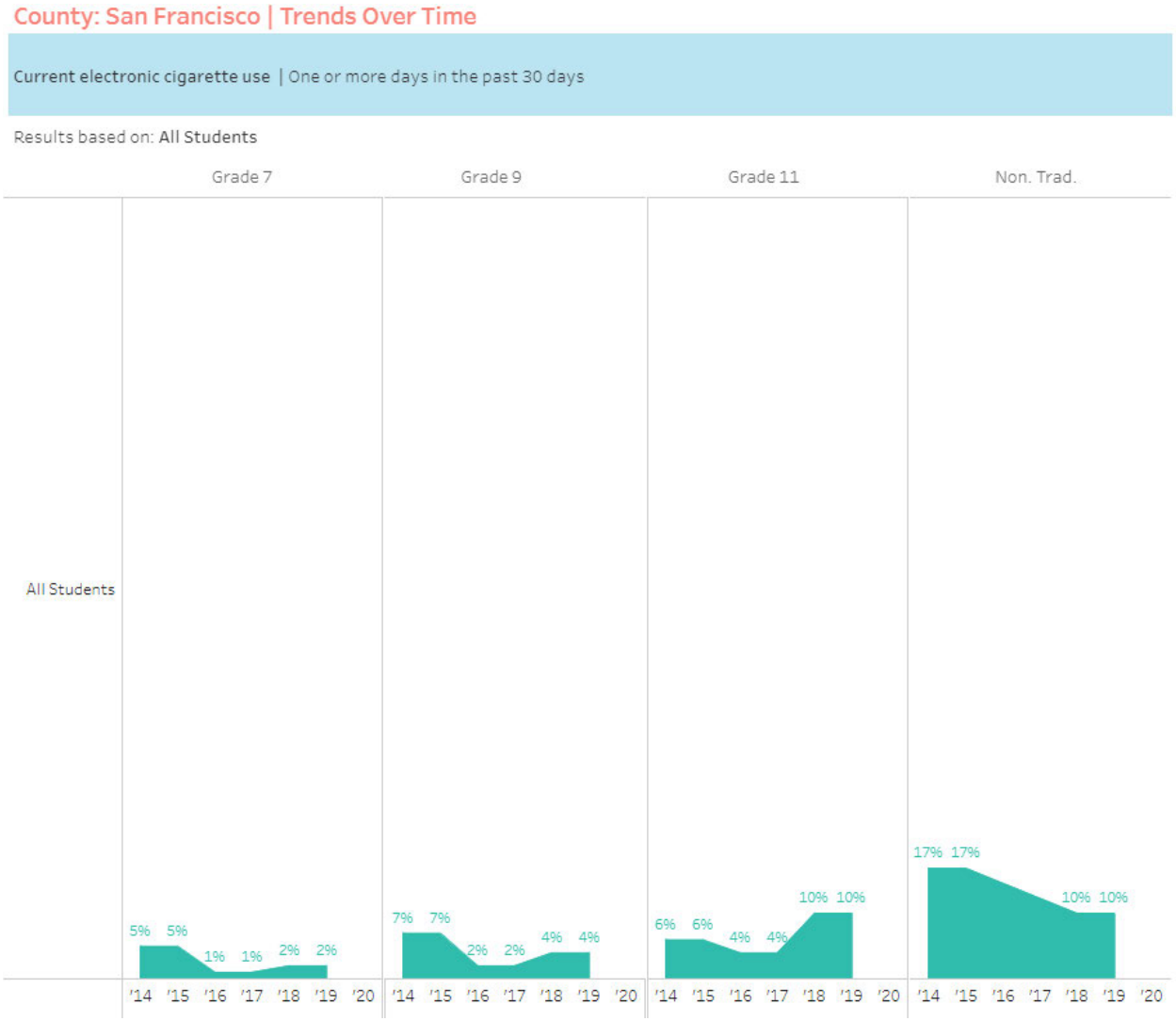
	Percentage of students who reported as being current users of e-cigarettes		**Percentage of students who reported as being ever-users of e-cigarettes**	
	2017	***2019***	***2017***	***2019***
Middle School	2%	3.7%	6.9%	8.8%
High School	7.1%	16%	25%	31.1%

Table 1: *Percentage of SFUSD secondary school students who reported as being current- and ever-users of e-cigarettes in 2017 and 2019.*

While the data for middle school students is highly concerning, the fact that high school student usage more than doubled in 2019 is alarming. According to SFUSD's interrogatory responses, SFUSD high school enrollment for the 2018-19 school year was 21,212.[68] Although no survey requiring self-reporting by youth paints the whole picture, it is reasonable to assume for the sake of illustration that the YRBS results are illustrative of the SFUSD student population. As a result, the YRBS results would more likely than not indicate that 3,394 SFUSD high school students were current e-cigarette users in 2018-19 and 6,596 had ever tried an e-cigarette or vapor product.[69] Similarly, based on SFUSD's reported middle school enrollment for the 2018-19 school year of 12,241, the YRBS results would more likely than not indicate roughly 452 SFUSD middle school students were current e-cigarette users and 1,077 had tried an e-cigarette.[70]

Results from the California Healthy Kids Survey ("CHKS") show similar trends for current e-cigarette use for 7th, 9th, and 11th grade students in SFUSD from 2016 through 2019 or 2020 (depending on the most recently available data).[71]

[66] Deposition of Quarry Pak, 5/27/2021, pgs. 18-19.
[67] SFUSD_000142; SFUSD_000162; SFUSD_000182; SFUSD_000202;
[68] SFUSD 2d Supp. Rog Responses, No. 2.
[69] SFUSD 2d Supp. Rog Responses, No. 2.
[70] SFUSD 2d Supp. Rog Responses, No. 2.
[71] https://calschls.org/reports-data/public-dashboards/secondary-student/.



These survey results help illustrate the severity of the e-cigarette epidemic plaguing SFUSD, but it does not tell the whole story. As with any survey requiring students to self-report behaviors that violate school policy and/or the law, the results may understate the true prevalence of the behaviors. Experience and accounts from SFUSD administrators and staff who deal with the issues day-to-day are also important in assessing the scope and impact of the problem of student e-cigarette use in SFUSD schools.

As Ms. Pak testified, "[w]e know from our surveys and our student conversations that more students are using e-cigarettes and the number is increasing."[72] She also stated that SFUSD has "an epidemic of ENDS use in its schools currently."[73] According to Ms. Kimberly Coates, SFUSD Executive Director of Student, Family, and Community Support, reports of increased e-cigarette use among SFUSD students have come from students, teachers, nurses, and social workers across the District.[74] Students have self-reported as addicted to nicotine and that they cannot stop using e-cigarettes and want to know more about how

[72] Deposition of Quarry Pak, 10/7/2021, pg. 182.
[73] Deposition of Quarry Pak, 10/15/2021, pgs. 273-75.
[74] Deposition of Quarry Pak, 10/7/2021, pgs. 34-35; Deposition of Kimberly Coates, 9/8/2021, pgs. 37, 49.

they can stop.[75] Ms. Coates testified that "we were hearing more and more from school sites and data was showing that students were using e-cigs and Juuling."[76]

In the context of professional development, i.e., training teachers and staff, SFUSD Program Director Erica Lingrell testified that "vaping has been a huge problem, so we've been focusing our professional development on that."[77] Similarly, Ms. Coates testified that although the District has a number of health concerns for its students, "Juuling or use of E-cigarettes is right at the top."[78] Ms. Coates noted that some of the reasons that e-cigarette use is a top priority are because "it is happening in the course of the school day and in classrooms. Unlike some of the other problems that may not be happening in the midst of a classroom, we can have students with Juul devices in school, while they are in the classroom, while they're in the hallway, while they're in the bathroom."[79]

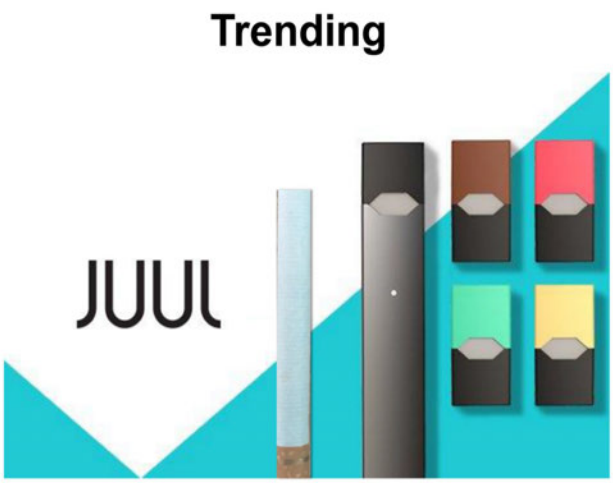
When asked about a 2019 email discussing the "growing problem" of vaping and the difficulties SFUSD faces in patrolling popular areas of student e-cigarette use, including during a particular incident involving students vaping openly, Ms. Pak testified that the occurrence was "very … emblematic – it's very illustrative of instances that have happened at other schools."[80] In its interrogatory response regarding the public nuisance in its schools, SFUSD stated:

> *Plaintiff's staff have observed student e cigarette use throughout school property, such as bathrooms, hallways, stairwells, classrooms, and outdoor areas. At least one high school began locking bathrooms during class time to make sure all students feel safe. Security personnel were needed to unlock the bathrooms when they were needed during class time*.[81]

Furthermore, the evidence indicates that JUUL products have been the most popular e-cigarette or vapor product among SFUSD students. Ms. Pak testified that JUUL "was or is the predominantly known product and most widely used."[82] JUUL was "the most popular product" and the "most familiar product to our students and staff."[83] Because of that, SFUSD professional development focused on JUUL, including a session titled "Juul School" conducted in Fall 2018.[84]

[75] Deposition of Quarry Pak, 10/7/2021, pgs. 77, 80.
[76] Deposition of Kimberly Coates, 9/8/2021, pgs. 33:9-13.
[77] Deposition of Erica Lingrell, 8/19/2021, pg. 36.
[78] Deposition of Kimberly Coates, 9/8/2021, pg. 33.
[79] *Ibid.,* pgs. 35-36.
[80] Deposition of Quarry Pak, 10/7/2021, pgs. 170-71.
[81] SFUSD 2d Supp. Rog Responses, No. 2.
[82] Deposition of Quarry Pak, 5/27/2021, pg. 23.
[83] Deposition of Quarry Pak, 10/15/2021, pgs. 309, 350.
[84] SFUSD_001936; Deposition of Quarry Pak, 10/15/2021, pgs. 309, 350; Deposition of Quarry Pak, 5/27/2021, pg. 33; Deposition of Quarry Pak, 10/7/2021, pg. 103.

Juul School



When discussing tobacco and nicotine education in the District and how it changed in response to the rise in e-cigarette use with SFUSD students, Ms. Lingrell testified that "we had to share about JUUL and let staff know what it looked like and what a problem it's becoming. … So we put more of a focus on Juuling and vaping than had happened before."[85] When asked if she was specifically referring to JUUL products, Ms. Lingrell responded: "Yes."[86] Ms. Lingrell stated further: "Specifically, on JUUL products. We did present with other products as well but with the emphasis that Juuls was a problem and letting them [teachers] know how to recognize the JUUL technology."[87] Similarly, when asked whether she thought "JUUL products are a particular problem in SFUSD schools," Ms. Coates responded "yes," noting the attraction of JUUL products to young people, including their concealability or "covert element."[88]

Like other school districts, SFUSD was faced with the enormous task of quickly developing both professional development and student-facing education materials to address the increased use of e-cigarettes by SFUSD students. Describing the public nuisance in the District, SFUSD stated the following in its interrogatory response:

> *Plaintiff has also incurred time and costs to develop curriculum, education, and training for school staff, students (including Plaintiff's Youth Outreach Workers), and parents, guardians, and caregivers. For example, vaping prevention resources for schools developed and distributed by Plaintiff's School Health Programs staff, which included information and resources for elementary through high school staff. Materials included could be used to "train staff … and families to recognize new vaping technology, understand the risks of usage, … [i]mplement Health Education lessons in the classroom to teach students about the risk of usage … [and to d]evelop a schoolwide plan to connect students to [Plaintiff's] Brief Intervention Services as an alternative to suspension."*
>
> *Other vaping education resources, developed by Plaintiff's nursing staff, include "Vaping 101" for high school, middle school, and elementary school staff, used*

[85] Deposition of Erica Lingrell, 8/19/2021, pgs. 46-47.
[86] Deposition of Erica Lingrell, 8/19/2021, pg. 47.
[87] Deposition of Erica Lingrell, 8/19/2021, pg. 47.
[88] Deposition of Kimberly Coates, 9/8/2021, pg. 45.

> *for educating those staff and teachers regarding vaping. Also, a Fall 2018 professional development training presented to Plaintiff's health educators and physical education teachers titled "JUUL School." Plaintiff's Youth Outreach Coordinators, Youth Outreach Workers, Teens Tackle Tobacco leaders, each of which are paid a stipend for their work, made presentations focused on vaping to raise awareness among students. Plaintiff also purchased tobacco cessation training for its Youth Outreach Workers. Plaintiff has also spent time developing middle school and high school lessons on e-cigarettes, including posters and visual aids. Plaintiff has incurred time and costs to offer support, intervention, and discipline to students, including Plaintiff's Brief Intervention Services, which Plaintiff previously hired a consultant to train its staff and Youth Outreach Workers on and still has a contract with the consultant for those same services. Plaintiff has incurred administrative time spent on developing new board policies and regulations to address vaping. Plaintiff has incurred time spent fielding additional media inquiries pertaining to e-cigarette use and vaping. Plaintiff has incurred time and costs for installation of anti-vaping signage in school buildings*.[89]

What SFUSD "found is that the amount of education that we had to do was more – substantively more than what we had to do previously before ENDS became available and Juul became available … because there was no knowledge" about what the products look like and what the effects were.[90] So SFUSD personnel had to develop the knowledge themselves rather than being able to rely primarily from the types of sources it would rely on for traditional tobacco, alcohol and drug resources. "New curriculum development is a very slow process."[91] Ms. Pak testified that "it took an inordinate amount of time" to educate thousands of staff on vaping both because of the number of people needing education but also because the products were knew and nobody knew anything about them, except that nicotine was addictive.[92] When asked how much time it took, Ms. Pak stated: "Years. And we're still working on it."[93]

SFUSD was also faced with overcoming students' misperceptions regarding the health risks presented by JUUL products. As Ms. Pak testified, from surveys and the observations of teachers and staff, SFUSD is "aware that students were not aware of the harms and the risks. That [students] didn't know about nicotine in Juuls or e-cigarettes."[94] Ms. Coates also noted this "misperception" when discussing the negative impact e-cigarette use has had on SFUSD, testifying that "in feedback that has been discussed through staff, students have the misperception that [e-cigarette usage is] safe."[95] As noted in SFUSD's interrogatory response, parent education has also been a necessary part of the response. Among other

[89] SFUSD 2d Supp. Rog Responses, No. 2; SFUSD_106217; SFUSD_115020; SFUSD_115021; SFUSD_115022; SFUSD_003477; SFUSD_014059;
[90] Deposition of Quarry Pak, 10/7/2021, pgs. 90-91.
[91] *Ibid.*, pg. 84.
[92] *Ibid.*, pgs. 94-96.
[93] *Ibid.*, pgs. 94, 84-85; Deposition of Quarry Pak, 10/15/2021, pgs. 100-01.
[94] Deposition of Quarry Pak, 10/7/2021, pg. 117.
[95] Deposition of Kimberly Coates, 9/8/2021, pg. 119.

things, SFUSD held a "Vaping Epidemic Town Hall for Parents" at James Denman Middle School in October 2019.[96]

As discussed above, SFUSD's support for students using e-cigarettes focuses on restorative interventions and positive behavior modeling. Ms. Pak testified to the tailored approach required for each student and each circumstance and how this approach, designed to achieve the best-possible student outcome, requires significant resources to get students the help they need.[97] From SFUSD's perspective, the most effective interventions for student e-cigarette use take more time and resources (including necessary staff training) than a suspension-first approach.[98] In response to the rise in e-cigarette use by students, SFUSD has "provided increased amounts of support, interventions, and counseling sessions and – with nurses and social workers."[99] And despite "try[ing] very hard … not to suspend," Ms. Pak testified that suspensions related to student e-cigarette use have "increased from none to substantially more," including "incidents of students selling e-cigarettes and Juuls to other students."[100]

Increased e-cigarette use by SFUSD students has caused significant disruption in the District. In its interrogatory response, SFUSD stated:

> *The increased possession and use of e-cigarettes by Plaintiff's students have caused disruptions in classrooms and common areas and require staff to take appropriate actions, diverting resources from classroom instruction and student supervision. Plaintiff's staff also take the appropriate time to provide education and assistance to students caught using nicotine, including restorative practices such as the district's Brief Intervention Services. Disruptions caused by e-cigarette incidents also negatively impact other students as staff take time to address the e-cigarette incident. Students caught violating the district's prohibited substances policies are removed from classroom instruction for some period, including out of school suspensions for certain offenses. This lost time makes it more difficult for students to appropriately progress in their education and requires additional resources to ensure continued student progression and well-being*.[101]

Ms. Lingrell, among other SFUSD district-level personnel, testified regarding the impact substance use has on the District's ability to educate students: "if students aren't learning… and not showing up for school, it impacts… our goal … to make sure …students show up, that they are ready to learn, that they attend school… our staff can't focus on other things. They need to focus on figuring out why the students are taking substances or how it's affecting their work, their behavior, their relationship to school."[102] Ms. Lingrell stated she had "heard several teachers complain that their students are leaving the classroom for long periods of time to go smoke Juuls in the bathroom or wherever they go; that

[96] SFUSD_003487.
[97] Deposition of Quarry Pak, 10/7/2021, pgs. 123-24.
[98] *Ibid.*, pgs. 131-34.
[99] *Ibid.*, pg. 136.
[100] *Ibid.*, pg. 138; SFUSD_002405.
[101] SFUSD 2d Supp. Rog Responses, No. 2.
[102] Deposition of Erica Lingrell, 8/19/2021, pg. 41.

they're losing their learning, and then the teacher has to take time away from the class to" locate the student.[103] Similarly, Ms. Coates testified that staff have expressed difficulty in "trying to stay in front of how often students are engaging in using e-cigs."[104] Teachers have "report[ed] disruption to instruction time [and] schools having to make difficult decisions about keeping bathrooms locked."[105] Continuing about the negative impact of e-cigarette use, Ms. Coates stated: "So the time and energy to address the issue [of e-cigarette use] with young people to make sure that they're getting the support that they need, the additional education that's required, all of that is -- you know, takes a lot of time and energy and is a disruption." Likewise, Ms. Lingrell testified: "this has been such a nuisance for our staff and … principals and security staff and nurses and teachers having to deal with kids going out of class to vape and … the students in the class are missing learning because the teacher has got to figure out what's happening."[106] Separate from the disruption to the learning environment and the resources necessary to provide support to students using e-cigarettes, Ms. Coates testified that the "disproportionate amount of time" staff are having to spend addressing "Juuling" makes it difficult for staff to attend to the many other needs and issues facing students.[107]

SFUSD personnel have also testified to the types of things that might help the District deal with the vaping epidemic in SFUSD. A repeated issue is time, i.e., additional staff. Ms. Lingrell testified that when asking student-facing staff what they need to improve prevention education, the answer is time.[108] "They need time in terms of just staff members," such as "having an extra security staff member, an extra nurse, an extra someone who can – who can manage all the problems that are coming up."[109] SFUSD personnel have identified a host of other needs, such as: increasing student awareness and education, increasing parent awareness, increasing community awareness, increasing staff awareness and training, additional security guards, additional prevention technology (e.g., cameras, vaping detectors), educating local retailers, installing signs in schools and nearby parks, tobacco cessation programming (particularly given the lack thereof for youth and young adults or specifically for e-cigarette use), and evidence-based prevention programming.[110] As discussed above, SFUSD prioritizes a restorative approach to student e-cigarette support. SFUSD's multi-faceted, restorative approach requires extensive resources.

6. Safe Havens' Assessment

6.1. Introduction

Safe Havens, a non-profit pre-K-12 school safety center, was retained to conduct an in-depth evaluation of student e-cigarette use at 31 secondary schools in SFUSD. According to the Centers for Disease

[103] Deposition of Erica Lingrell, 8/19/2021, pgs. 70-71.
[104] Deposition of Kimberly Coates, 9/8/2021, pg. 110.
[105] *Ibid.*, pg. 110; SFUSD_164603.
[106] Deposition of Erica Lingrell, 8/19/2021, pg. 170.
[107] Deposition of Kimberly Coates, 9/8/2021, pgs. 151-52.
[108] Deposition of Erica Lingrell, 8/19/2021, pgs. 169-70.
[109] *Ibid.*, pg. 170.
[110] Deposition of Quarry Pak, 5/27/2021, pgs. 78-79, 133-34; Deposition of Quarry Pak, 10/15/2021, pgs. 383, 387-89, 393-96, 399, 401-402, 408-09; Deposition of Erica Lingrell, 8/19/2021, pgs. 171:10-13.

with a group of students gathering, I do not recommend that nicotine detection swabs be used to detect which students have vaped.

For the appropriate purpose, I do recommend the use of both nicotine and THC detection swabs as they can be of value in several ways. First, if a student is caught with a vaping device, both nicotine and THC detection swabs can be used on the device to determine if the student has recently vaped THC or nicotine or both. This will help school officials refer the student to a proper treatment and/or cessation program as appropriate. Second, if one or more students are found unconscious with one or more vaping devices nearby, the use of both THC and nicotine detection swabs on the devices can determine if the students have likely vaped THC, nicotine, or both. This can provide helpful information to those providing emergency medical assistance.

Based on my experience and review, I find SwabTek™ to be the best brand to use. According to the company, SwabTek™ swab kits have been sold to more than 500 public school systems for several years. I find that SwabTek™ offers safe and easy-to-use presumptive tests designed to make field testing possible and easy for school officials to detect residue of nicotine, THC, and other controlled substances. SwabTek™ tests are a single-step test that uses dry-reagent chemistry, which is a well-established field-testing process. I also find that SwabTek™ field tests have an adequate degree of reliability and accuracy to make them beneficial in helping school and law enforcement officials investigate e-cigarette incidents. SwabTek™ nicotine and THC detection swab kits are also relatively inexpensive and can be purchased in bulk quantities. I recommend SwabTek™ nicotine and THC detection swab kits for school administrators, school district security, athletic trainers, and school nurses at SFUSD secondary schools.

5. In order for SFUSD to implement and maintain the customized comprehensive and multi-disciplinary strategies, significant short-term as well as long-term funding will be required.

The following describes the cost associated with the various recommendations that I find will be required to address the problem of e-cigarette use in SFUSD schools:

a. Cost of technology

The cost of the recommended technologies as part of the comprehensive, multi-disciplinary strategy to effectively and properly prevent and address e-cigarette use by students at schools is described below. As detailed above, 30 SFUSD secondary schools recommended for technology-based measures in this report will need vape sensors for school buildings, additional cameras and analytics for school grounds, and access control systems for doors.[151] In order to determine the cost to deploy these technologies that I recommend, a costing analysis was performed by a licensed architect and engineer, Robert Rollo. Mr. Rollo has considerable experience and expertise in cost estimating for large infrastructure projects for school systems. Mr. Rollo has performed a detailed cost estimating analysis for deploying the technologies recommended in this report at each of the secondary schools in the District. Mr. Rollo has issued a separate written report which details the costs associated with these recommendations.[152]

[151] I note that I did not calculate the cost for certain items in the strategy for SFUSD secondary schools, such as policies, hall-pass approaches and nicotine and THC detection swabs, because these items are either no-cost or relatively low-cost approaches.
[152] Robert Rollo Vape Mitigation Infrastructure Facility Cost Report, San Francisco United School District.

According to his analysis, the total cost for the technology items recommended for the 30 secondary schools in SFUSD recommended for technology-based measures in this report is $58,448,647. The following itemizes the cost for individual technology recommended in this report based on Mr. Rollo's estimation:

- Vape detection systems for the 30 SFUSD secondary schools: $44,911,680
- The pool of 300 spare wireless, battery operated vape sensors for SFUSD: $235,125 (the per unit cost for each sensor is based on Mr. Rollo's unit price of $783.75)
- Smart camera systems for the 30 SFUSD secondary schools: $11,492,966
- Access control systems for difficult-to-supervise areas at the 30 SFUSD secondary schools: $1,808,876

b. Cost of additional personnel to support the technology-based measures in the comprehensive strategy to effectively and properly prevent and address e-cigarette use by students

A fourth theme that emerged from interviews, case studies, the questionnaire, and expert panels was the frequent failure of technology as a result of the "human element" such as limited staff capacity, lack of training, and lack of funding to faithfully implement the intended technology. Examples included lack of staff to monitor video feeds or tip lines, staff propping open back doors that were locked, staff leaving radios in their classrooms, and the lack of manpower to investigate tips, alleged bullying, or other reported threats. Through our discussion with the experts, it became clear that technologies are often not implemented as intended, and, therefore, they may not be effective because of how they are actually used in the field as opposed to how they were intended to be used.[153]

School safety technology can help make efforts to improve school safety more effective and efficient and can significantly reduce the need for additional personnel in some instances, but technology should be viewed as a supplement to rather than a replacement of human efforts. While a primary goal of the approaches that I recommend has been to carefully develop an array of technologies to address the impact of e-cigarette use by students at SFUSD without necessitating a substantial increase of new and costly positions, some additional personnel will be required.

Without proper human support, technology will not work effectively to provide the value required. As just one example, the installation of cameras and vape detectors alone will not effectively reduce vaping in SFUSD secondary schools without the assistance of staff to promptly respond to the alerts provided by those technologies. I therefore recommend an increased level of personnel as an integral part of the comprehensive approach to address the complex problems resulting from student e-cigarette use. As with technology enhancements, the types and number of positions for major security technology upgrades varies between school districts depending on various factors such as present staffing levels,

[153] Heather L. Schwartz et al., "The Role of Technology in Improving K-12 School Safety," RAND Corporation, 2016, pg. 74.

extent of the problem of student e-cigarette use, union agreements, and building designs. For the comprehensive, multi-disciplinary strategy that I recommend in this report to work, these personnel staffing costs will be a recurring annual budget item for some school districts for a number of years. I recommend maintaining funding for any new positions created to support the comprehensive, multi-disciplinary strategy to prevent and address students using e-cigarettes at schools for 15 years based on the opinions offered by other experts in this litigation concerning the necessary duration of e-cigarette mitigation strategies.[154]

In addition to supporting the recommended technologies, I find that the District will need additional personnel to address the significant challenges it has encountered in consistently implementing measures to prevent and intervene in student e-cigarette use. As described in detail throughout this report, the relatively sudden, severe, and pervasive level of student e-cigarette use has created substantial overtasking of District personnel. This overtasking has in turn resulted in challenges for SFUSD in its efforts to address the problem of student e-cigarette use effectively and consistently. The additional positions that I recommend will enable SFUSD to consistently perform the many individual tasks required to address the problem of student e-cigarette use such as communicating relevant policies, consequences of violations, reporting requirements and mechanisms, processes, and the available assistance and resources for students, District personnel and parents/caregivers.

The additional personnel will also enable the District to achieve greater consistency in the investigation, documentation and enforcement of e-cigarette policies as well as in how consequences, support and assistance are provided to students caught violating the District's policies pertaining to vaping. These personnel will also be necessary for the District to continually measure, test, and re-evaluate the District's efforts to address student e-cigarette use as described elsewhere in this report.

The following are the types of additional personnel that I believe are needed for SFUSD to effectively address the problem of student e-cigarette use:[155]

i. <u>E-cigarette Prevention and Intervention Facilitator</u>

As detailed in Safe Havens' Assessment (Section 6), SFUSD currently does not have any personnel dedicated to providing oversight for the District's efforts and focused support for its secondary schools to prevent and address the widespread and serious issue of student e-cigarette use. I have often suggested for school districts experiencing significant school safety threats and risks such as bullying, suicide, and self-harm to have personnel dedicated to focus on these specialty areas based on the scope of the threats and risks, challenges, size of the district, etc.

Since the emerging problem of student e-cigarette use has posed a serious threat and risk to the health and safety of SFUSD students and the learning environment as demonstrated throughout this report, I

[154] *See* Expert Report of Dr. David Cutler.

[155] I understand that other experts in this litigation with specialized expertise in youth tobacco use prevention are recommending strategies to address and reduce student e-cigarette use in SFUSD and may be recommending that certain other additional personnel are necessary. My recommendations are limited to the additional personnel that I believe are necessary to implement the technological approach that I have developed. As it relates to the specific issues such as prevention education and counseling and cessations strategies, and the associated costs, I will defer to the recommendations of these experts.

find that SFUSD will need one new E-cigarette Prevention and Intervention (EPI) Facilitator position. The primary roles of the personnel serving in an EPI Facilitator position would be to help develop, implement, coordinate, and evaluate the District's efforts to more effectively address student e-cigarette use. Examples of the types of tasks the EPI Facilitator will be responsible for include but are not limited to:

- Hiring, training, supervising, and coordinating the work of the new Regional EPI Coordinators, EPI Campus Assistants, EPI Technology System Monitors and EPI Information Technology (IT) Specialists.
- Developing and providing oversight for the budget related to e-cigarette prevention and intervention measures.
- Measurement and fidelity testing of e-cigarette prevention and intervention strategies.
- Overseeing the overall implementation and evaluation of:
    - Awareness training programs for staff, students, and parents.
    - Cessation programs for students who require it due to nicotine addiction.
    - New technologies (such as vape sensors, e-hall-pass systems, etc.).
- Reporting to the District leadership team and school board on the progress of the District's efforts to address student e-cigarette use utilizing available measurement and fidelity testing data.

Based on my review of other current positions of similar duties at SFUSD, I find that position of Central Office Program Administrator at SFUSD is an appropriate and comparable job classification and salary level for the new EPI Facilitator position. Based on the information from the District, the annual cost for the new EPI Facilitator position would be $118,114 per year for salary, plus an additional cost for benefits.

ii. <u>E-cigarette Prevention and Intervention Coordinators</u>

I find that SFUSD will need EPI Coordinators. Based on the size and complexity of SFUSD as well as the pervasive of student e-cigarette use in the District, I recommend five EPI Coordinator positions for SFUSD. The primary roles of the personnel serving in these positions would be to help develop, implement, coordinate, and evaluate the District's efforts to address the problem of student e-cigarette use at SFUSD schools impacted by vaping. I find that these positions are critical because at present, building administrators, school security, and district-level personnel are currently overtasked by issues associated with e-cigarette incidents and must still maintain the core responsibilities of their traditional job duties. Whether the safety challenge to be addressed involves problems with gang activity, violence with weapons or student e-cigarette use, major enhancements typically require additional personnel for effective program implementation and maintenance. Examples of the types of tasks these personnel will be responsible for include but are not limited to:

- Using data and information from student and staff reports, to deploy battery operated wireless vape sensors from the pool of available devices to the EPI IT specialists to address concerns of student e-cigarette use in schools.

- Providing advanced investigative support for e-cigarette violations which result in property damage, serious injury or death.

- Reporting to the EPI Facilitator on the progress of their region's efforts to address student e-cigarette use utilizing available measurement and fidelity testing data.

- Help District and building administrators improve consistency with communicating policies, expectations, signage, and enforcement of student conduct policies.

- Assist building administrators and EPI Technology System Monitors conduct investigations of more challenging and time-consuming vaping incidents.

Based on my review of other current positions with comparable duties or responsibilities at SFUSD, I find that the position of an experienced teacher with a master's degree is an appropriate and comparable job classification and salary level for the new l EPI Coordinator positions. In my experience, this salary level will allow SFUSD to attract and retain qualified personnel to fill these positions. I believe that experienced teachers will be able to communicate effectively with staff, students, administrators, parents, and other caregivers as they have had to do in their roles as classroom teachers. This approach is consistent with what school districts often do for prevention programs, new energy manager positions, and other similar positions.

Based on information from the District for the salary of an experienced teacher with a master's degree, the annual cost for each new Regional EPI Coordinator position would be $48,042.00 per year for salary, plus an additional cost for benefits.

iii. <u>E-Cigarette Prevention and Intervention Campus Assistants</u>

I find that the District does not have adequate personnel to address the need for increased and specialized student supervision in schools where the problem of student e-cigarette use is the most severe in the District. Rather than simply adding positions at each secondary school that reports significant vaping issues, I find that a more practical, effective and sustainable approach would be to utilize a pool of available personnel that can be deployed by the EPI Facilitator to specific schools based on feedback from the EPI Coordinators and the data on student e-cigarette violations, survey data and other data. I have often recommended a similar approach to school districts as a more effective means of human resource allocation than simply adding large numbers of additional safety personnel to each secondary school to address other pervasive concerns such as student weapons violations, gang activity, truancy, etc.

Based on the size of SFUSD and the fact that the level of student e-cigarette can vary use over time, I find that five of these assistant positions will be needed. Based on my review of other current positions of similar duties at SFUSD, I find that the position of School Monitor at SFUSD is an appropriate

comparable job classification and salary level for the new positions. Based on information from the District for the salary of a School Monitor, the annual cost for each new EPI Campus Assistant position would be $41,925.00 per year for salary, plus an additional cost for benefits.

iv. E-Cigarette Prevention and Intervention Information Technology Specialists

I have found that many school districts do not have adequate staffing for IT personnel to accommodate major upgrades in security technologies comparable to what I recommend for SFUSD. Consistent with my recommendations for many other school districts that I have assessed for significant security technology upgrades, I find that SFUSD will require the addition of two new EPI IT Specialists dedicated specifically to provide oversight for the implementation and maintenance of the new technologies recommended in this report. Based on my review of other current positions of similar duties at SFUSD, I find that the duties of a Security Systems Technician at SFUSD is an appropriate and logical comparable job classification and salary level for the new EPI IT Specialist positions. My recommendation of only two new EPI IT Specialists for SFUSD is very conservative given the size of the District and the amount of additional devices required to address the student e-cigarette problem.

The new EPI IT Specialists will provide the ongoing technical support required for smart cameras, analytic software, vape sensors, and access control recommended for SFUSD in this report. I recommend this staff member work in the IT Department but be supervised by the EPI Facilitator.

Based on information from the District for the salary of a Security Systems Technician, the annual cost for each new EPI IT Specialist position would be $70,406.00 per year for salary, plus an additional cost for benefits.

v. E-Cigarette Prevention and Intervention Technology System Monitors

I find that the District does not have adequate personnel to perform the real-time live monitoring of e-cigarette prevention and intervention technologies that I recommend in this report. In my experience, adequate coverage is needed from the time of morning arrival until late evening hours when after-school programs are conducted at secondary schools. Additionally, coverage is sometimes needed for situations where high levels of activity justify coverage on weekends. To accomplish necessary coverage, I recommend adding three new EPI Technology System Monitor positions for SFUSD. These new positions will have alternating work hours based on school schedules and special activities. I recommend that the new EPI Technology System Monitor personnel be supervised by the EPI Facilitator.

Based on my review of other current positions with comparable duties or responsibilities at SFUSD, I find that the position of Emergency Communications Operator is an appropriate and logical comparable job classification and salary level for the new EPI Technology System Monitor positions. Based on information from the District for the salary of an Emergency Communications Operator, the annual cost for each new EPI Technology System Monitor position would be $68,562.00 per year for salary, plus an additional cost for benefits.

c. The approaches not recommended

While I recommend a wide variety of approaches to be included in this comprehensive strategy for SFUSD, I have also made a conscious effort to recommend only those enhancements that are necessary to address the well-documented negative impact of student e-cigarette use on students and the school environment. My recommendations have built in what I often refer to as "force multipliers" to provide a high degree of protection while reducing the cost of physical upgrades and the need for additional personnel. I have intentionally not recommended additional resources that some SFUSD personnel expressed an interest in because I believe that the array of resources that I do recommend, combined with flexibility in how they can be utilized, will, in my experience, accomplish more with less.

Again, the goal of my recommendations is not to create schools where it is impossible for some students to vape without detection on rare occasions, but instead to create a practical and sustainable comprehensive approach which will make it unlikely that a student could regularly and repeatedly use e-cigarettes on SFUSD school campuses. Therefore, in addition to the recommendations I have included in this report, I also considered and decided against recommending a variety of other potential options for addressing the problem with student e-cigarette use in SFUSD schools. As detailed later in this section, I decided not to recommend those options for a variety of reasons, including but not limited to:

- I determined that the approach (such as entry point metal detection) was not effective, practical, or sustainable.
- I determined that other approaches I have recommended would be more effective, practical, or sustainable.
- I determined that while the approach would be effective, it would not provide enough benefits to justify its cost.
- I determined that even though the approach (such as the renovation of student restrooms incorporating "lazy S" entryways) would be highly effective, it would not be feasible or possible to accurately estimate the cost of the approach.
- I determined that the potential negative impacts as well as the cost of the approach (such as a vape detection canine) would outweigh the benefits it would provide.

The following are some of the options I decided not to recommend in the comprehensive, multi-disciplinary strategy to enable SFUSD to effectively and properly prevent and address student e-cigarette use:

i. Labor-intensive approaches

While I recommend a relatively modest increase in new positions to support the measures in the comprehensive, multi-disciplinary strategy for SFUSD, I do not recommend the addition of larger numbers of staff even though it was desired by some SFUSD personnel. In my opinion, a blending of policies, practices, and technologies with support from a limited number of staff in the comprehensive strategy I developed for SFUSD will be much more practical, sustainable and effective than labor-intensive approaches. As is my typical approach for other school safety assessment projects, I focused on identifying practical, effective, and sustainable approaches by using a blend of free or low-cost measures, such as policies and practices, combined with the use of technologies supported by a limited number of staff. This approach reduces the number of staff needed to address the problem. By using

robust technologies, policies, and practices in the strategy for SFUSD, I did not have to recommend the following additional positions:

- School district police officers
- Campus monitors, security officers, or hall monitors assigned to every secondary school campus
- Building administrators
- A vape prevention coordinator for each secondary school

In addition, my recommended approach which uses policies, practices, and technologies when appropriate (such as for improved student supervision) will, in my experience, be more effective than an approach which relies primarily upon large numbers of staff to monitor difficult to supervise areas. While I considered the potential for additional positions based on my area of specialized expertise, other experts in different disciplines may opine on the need for additional personnel in their areas of specialization such as personnel to provide staff development, awareness for students or personnel to provide cessation program services, etc. My opinions in my area of specialization are in no way intended to contradict those who are qualified to opine on the need for additional positions if and as they determine to be appropriate.

ii. Vape detection canines

I find that in some school districts, the use of vape detection canines can be effective in deterring e-cigarette use if and as appropriate to local conditions. However, I do not recommend this for SFUSD. As an experienced gun detection canine handler, I have found this approach to be highly impactful and effective for street drug, firearm, and explosive detection. I do not, however, recommend this approach for e-cigarette detection in SFUSD due to the high cost associated with the approach and the potential for this measure to decrease student and parental support for the overall comprehensive strategy. This approach requires significant funding for dog purchases, boarding, veterinary bills, support staff, etc. In my experience, the use of detection canines can also create a negative school climate, particularly if used in the presence of students. I also believe that the measures I do recommend, combined with the significant efforts that have already been implemented by SFUSD, will be adequate for the District to address the problem of student vaping without the need for vape detection canines. Therefore, while vape detection canines can be a logical choice for some school districts, this approach is not a logical choice for the size and complexity of SFUSD in light of the other approaches I recommend.

iii. Walk-through metal detectors

While multiple vendors have suggested the use of walk-through metal detectors to screen students for e-cigarettes, I do not recommend this approach due to (1) the substantial funding required for an effective approach, (2) the challenges created by requiring students to arrive 20-45 minutes early each school day to allow for screening of large numbers of students with only a few checkpoints, and (3) the increased risks of attacks on students who are gathered in large numbers at checkpoints to be screened. In my experience, effective use of metal detectors in K12 schools requires not just the use of metal detectors and properly trained personnel to operate them, but a host of supportive measures to prevent students from finding ways to simply bypass the screening checkpoint. A few common examples

include students passing through a checkpoint and then opening a side door to obtain contraband from a student after being screened; placing contraband on a restroom window ledge before entering the school, passing through the checkpoint and then retrieving the contraband by opening the window; or bringing contraband into the school during an afterhours event (such as a parent teacher association meeting) when screenings are not conducted and concealing the contraband for later retrieval and use.

I have considerable hands-on experience using both walk-through and hand-held metal detectors for nearly a decade as a practitioner, and I have helped manufacturers improve the devices and equipment as well as how they can be more effectively utilized in K12 schools. Based on my experience, I do not consider the daily use of walk-through metal detectors for the prevention of student e-cigarette possession and use to be an effective, sustainable, or practical approach to this specific problem. I have also helped multiple school districts in various regions of the nation estimate costs for effective entry point metal detection and security X-ray screening programs, and I have found that the cost for an adequate number of staff to provide reasonably effective screening for the detection of firearms typically varies from between $500,000 and $1,000,000 per year per school. The cost to provide a comparable level of effectiveness for e-cigarette screening and detection would be even higher because the sensitivity of the devices would have to be set at much higher levels to detect the significantly smaller amount of metal in most e-cigarettes as compared to firearms. This, in turn, would require far more follow up scans with hand-held metal detectors and more intrusive physical "pat downs" of students because of the number of small metal objects that would set off an alert. Therefore, I do not recommend the use of walk-through metal detectors as part of the comprehensive strategy to enable SFUSD to effectively prevent and address student e-cigarette use at schools.

iv. Nicotine detection swabs on the hands, face, and/or clothing of a student suspected of using e-cigarettes

I explored the possibility that nicotine swab units could be used to detect trace evidence of vaping on the hands of students suspected of using e-cigarettes. For example, if a vape sensor alerted and five students were observed leaving the restroom as an administrator approached, the use of nicotine swabs on the students' hands could help school officials potentially identify which of the students had been using e-cigarettes. This would be similar to the approach used by TSA agents to deter people from attempting to sneak firearms and explosives through airport security checkpoints. However, I found that the currently available nicotine swabs are not effective for this type of application. I did learn that swabs to detect THC residue will work for this type of application as long as students have not had an opportunity to wash their hands and wipe residue off of their clothing before the swab tests are conducted.

v. An HID hall-pass system using smart cards

I reviewed an impressive and highly robust e-hall-pass and access control system produced by HID Location Services (https://www.hidglobal.com/rfid-identification-sensing) that uses student identification (ID) cards with proximity smart card technologies. This system can accomplish most or all of the features of web- and phone app-based hall-pass systems as well as provide other helpful features such as automatically sending an alert to school administrators or authorized personnel when a student deviates from the route to or from the location that the hall-pass was issued for. For example, if a

student requests a hall-pass to use the restroom on a particular hallway but then attempts to go to the school cafeteria, an alert will be sent to designated school personnel.

This type of hall-pass system also allows school officials to lock potential trouble areas such as locker rooms, auditoriums, and student restrooms and grant access to those areas to only authorized students who have been issued an e-hall-pass. In an even more advanced approach, this e-hall-pass system can also be integrated with modern smart camera analytic software systems to make it even easier for school personnel to detect abuse of an e-hall-pass. For example, when integrated with the e-hall-pass system, the analytic software will detect a student's deviation from the approved route automatically and will cause the live video feed to pop up as a real-time message on computer monitors, portable phones or even on portable radios with video capability.

With an estimated cost of approximately $200,000 plus an estimated $20,000 recuring annual cost for a single SFUSD high school, even with the many significant advantages of this system over any other available e-hall-pass systems I considered, I cannot recommend this system as practical for SFUSD based on the benefits it offers specific to the problem of student e-cigarette use, particularly in light of the low-cost or no-cost e-hall-pass systems that are available.

vi. Magnetic holdback devices on hallway fire doors and stairwell doors

Magnetic holdback devices help keep doors in the open position but will release the doors so they will close automatically if the fire alarm is activated. If and when they can be utilized, I find magnetic holdback devices on doors to be extremely beneficial in enhancing safety, security, and emergency preparedness. The use of magnetic holdback devices allows for hallway, corridor, and stairwell doors to be kept open to increase natural surveillance while still maintaining compliance with fire codes. This helps increase the ability of students and staff to see and hear indications of a safety situation (such as student e-cigarette use, or an overdose related to e-cigarette use) in that area. However, this approach can be costly, and it would not be feasible or possible to accurately estimate the cost of retrofitting this approach into existing buildings as part of my assessment. Therefore, I did not recommend this approach as part of the comprehensive strategy for SFUSD.

Photo by Michael Dorn

vii. Some emerging camera analytics

I also considered but am not recommending a number of emerging camera analytics and features that have great promise but are not in my opinion feasible at present. Additionally, the basic analytics that I do recommend in this report offer the most helpful and effective features. One of the analytics currently being developed would utilize depth sensor technology to detect vaping. This analytic would use a future design of smart camera which would act as a 3D camera, analyzing the width, height, area, volume, and more of objects in view. In the case of vaping aerosol, it is likely that this type of system will be able to detect even minor amounts of mist from e-cigarettes. Deploying this approach would require new smart cameras as well as the new analytic. Because the system that I do recommend for SFUSD is open architecture, it will allow for this type of camera to be used if it becomes available.

viii. Facilities enhancements

There are also a number of facilities enhancements that can be valuable but are difficult to accurately estimate from a cost standpoint and would not provide as much impact as compared to the measures that I am recommending. For example, utilization of the concepts of Crime Prevention Through Environmental Design (CPTED) for future new school construction and major renovation projects would be beneficial to SFUSD. This approach can be costly, and it would be very challenging to provide accurate cost estimates. While two of the three primary tenants of CPTED are well-suited to help address the challenges posed by e-cigarette use, natural surveillance (i.e., increasing the ability to see and be seen through building designs) and positive territoriality (i.e., increasing the sense of ownership and responsibility among students, staff and parents through visual features such as murals and color schemes), it would be very challenging to provide accurate cost estimates for these two types of enhancements and to justify the expense in relation to other approaches that I recommend. Some examples of the types of CPTED enhancements that could be valuable in addressing student e-cigarette include:

- Reconfiguration of student restroom entryway designs with “lazy S” restroom entryways, which makes it more difficult for students to detect a school staff member entering the restroom due to the sound of the restroom door being opened. This can help deter students from using e-cigarettes in the restroom.

Photo by Michael Dorn

- Improving positive territoriality through the use of murals, color schemes and other visual physical features. This approach is helpful to create and maintain a positive school climate, especially when security measures (such as security cameras installed in various parts of the school building) are significantly increased. My experience has been that the use of murals, color schemes and other visual features can be very effective in minimizing the potential for an institutional feel resulting from extensive security upgrades.

Photos by Michael Dorn

Each of these physical enhancements are extremely effective examples of CPTED. Multiple studies have found that CPTED has been effective at reducing illicit behaviors in public settings, including K12 schools. My experience supports these research findings. However, accurate cost estimation for many of these potential upgrades can be difficult. As an example, the cost of renovating a single student restroom into a lazy S configuration to improve natural surveillance can vary dramatically due to factors such as

asbestos abatement, addressing the removal of load bearing walls, or addressing structural issues present due to the proximity of an elevator shaft to a restroom. Therefore, I do not recommend any of these physical enhancements to be included in the comprehensive strategy for SFUSD.

6. **In order for the comprehensive, multi-disciplinary strategy to prevent and address student e-cigarette use at schools to achieve a high degree of effectiveness, SFUSD will need to continually measure, test, re-evaluate, and, if and as needed, make adjustments to the strategy using a structured approach.**

As with other approaches to improve school safety and security, the strategy I developed to enable SFUSD to effectively prevent and address student e-cigarette use will need to be continually measured, tested, re-evaluated, and, if and as needed, adjusted to increase the level of effectiveness and sustainability. Specifically, when SFUSD implements the measures in the recommended strategy, I recommend that the District develop a continual, robust, and structured fidelity testing and measurement approach, which in this context involves the use of various information gathering methods (such as student surveys, data collected from cameras, etc.) to track progress and evaluate various aspects of the implemented measures. As with any major school safety upgrade, it is inevitable that some gaps, inconsistencies, and other opportunities for improvement will occur as the District implements the measures in this comprehensive strategy. This approach will provide a high degree of quality control and will improve the District's capabilities to flex and adjust resources if and when needed to improve how the additional resources are utilized.

For example, if data from the fidelity testing and measurement method show a significant decrease in vaping at one high school but less progress in another school, the data will allow school officials to identify reasons for the differences in outcomes and the adjustments that can be made to improve the effectiveness of the e-cigarette prevention and intervention measures for the school. If the hotspot analysis, tracking analytic software, and student survey data show that some students have identified a new location in a stairwell where they can vape with a low risk of being caught, school officials could make several adjustments such as:

- Using the software features of the vape sensors to adjust the sensitivity of the units in the stairwell.
- Adding wireless and battery operated vape sensors to the trouble spot.
- Adjust the view of the smart cameras covering the problem area.
- Designate the stairwell as a "No Go" or as a "Walking Only" zone for the time(s) of day when violations have been occurring.
- Increase patrols of the problem area by staff during the time period(s) when vaping is reported to occur.

The following are some of the various fidelity testing and measurement methods that SFUSD should use after the implementation of the measures recommended in this report. I note that the additional staffing as part of the comprehensive strategy should, in my experience, provide the District with

adequate resources to conduct the data gathering and analysis as well as to develop and implement necessary adjustments or changes based on the results of the evaluation and analysis.

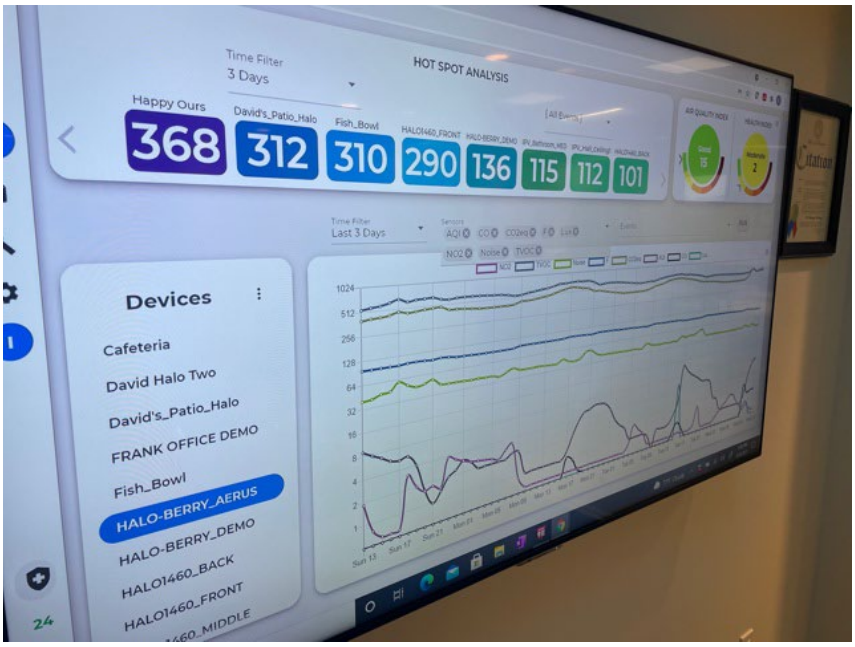


Photo by Michael Dorn

a. Data collected from installed vape sensors

I recommend that the District periodically review the data collected by the vape sensors to track the locations, frequency, and times of the school day where alerts have been received. All three manufacturers of vape sensors recommended in this report offer robust software capabilities to help school officials collect and analysis this type of data. The data results can be used to determine if any adjustments in student supervision, e-hall-pass usage, camera orientation, and vape sensors should be made to make the measures more effective. For example, if there is an unusual delay between the time that a student vapes in an area and when the nearby vape sensor alerts, the sensor can be adjusted to reduce the delay and, if needed, a portable wireless vape sensor can be added.

All three manufacturers of vape sensors I recommend have excellent software to track alerts which can be used to more accurately tune the sensors, and which can help school officials identify patterns of alerts so they can be addressed using additional vape sensors, repositioning of camera angles, enhanced student supervision efforts, the addition of No Go zones or other measures.

b. Data collected from the e-hall-pass system

E-hall-pass systems can help school officials spot patterns of concerning student hall-pass use that can indicate potential vaping incidents. While this is extremely difficult to accomplish using traditional paper-based hall-pass systems, many e-hall-pass systems automate the tabulation and review of this type of data. For example, one of the common indications of student e-cigarette use at schools is when students repeatedly try to obtain a hall-pass so they can leave the classroom during instructional periods to go to a more difficult to supervise area to vape.

An e-hall-pass system will make it easier for school administrators, teachers, and other authorized personnel to spot patterns of abuse of hall-passes. If a student frequently asks for a pass, school administrators or teachers can quickly and easily review the data collected from the system and detect this pattern of hall-pass use. For example, a ninth-grade algebra teacher would be able to spot that a student in her class who requests a hall-pass has been issued seven passes in the past two days by different teachers. With a paper-based hall-pass approach, teachers and administrators often fail to spot these types of patterns because it would be too time-consuming for staff to manually record each hall-pass issued, distribute the list to all teachers and to review each teacher's documentation and manually search for unusual patterns.

The information derived from the e-hall-pass system will help school administrators or teachers rapidly spot these types of unusual patterns, so they can investigate to find out if the student who has been asking for so many passes has a legitimate reason. Personnel who are authorized to monitor the school's camera system can also be advised to be alert for unusual behaviors exhibited by students who have been found to be abusing hall-passes. This could help spot attempts by a student who is addicted to nicotine to try to find a location where they can vape regularly. The system also makes it easy for administrators to spot any teachers who are issuing a far greater number of hall-passes than is typical of other teachers in the same school. The school administrators can use this information to help the teachers better understand and comply with the school's established norms regarding when hall-passes should be issued. School personnel should regularly review data from the e-hall-pass system to improve their practices which is possible using the features of the e-hall-pass system I have recommended for SFUSD.

c. Data collected from analytic software

I recommend that the District periodically review data collected from the analytic software to identify areas of concern and to work with school personnel to improve supervision. For example, the tracking analytic software I have recommended will enable school personnel to identify areas where students are congregating to use e-cigarettes and to identify solutions to increase supervision for those areas (such as adjusting the camera view, assigning staff to supervise the areas during times of concern, or to designate an area as a "No Go" or "Walking Only" zone). This will help school personnel find out if the students have been congregating in the area to use e-cigarettes or for some other reason. These analytics also help school personnel detect new patterns of students gathering in locations and/or at times that are atypical and find ways to address the issue.

d. Anonymous surveys of students and reported incident data

The District should consider conducting surveys of middle and high school students annually to measure the effectiveness of the implementation of the strategy recommended in this report. Using standardized and defined terms, these surveys should include questions about the prevalence of vaping by students at school. The survey can help school personnel evaluate the effectiveness of and opportunities for improvement in how the recommended strategy is implemented. Survey data should be compared to data relating to e-cigarette policy violations. By comparing and contrasting these two types of data, a clearer picture of the frequency and patterns of e-cigarette use by students can be obtained while also helping to measure progress of the comprehensive prevention and intervention strategy.

e. "Hotspot" analysis

The District should consider conducting hotspot analysis using paper or virtual floorplans of its middle and high schools to obtain feedback from students. In this activity, students are instructed to place visual markers on the school's floorplans to indicate the locations where students have seen or been aware of e-cigarette use. The activity facilitator, who is often a teacher, will identify the "hotspots" which are clusters of markers placed by the students. The facilitator can then ask the students for more information regarding the hotspots, such as the time(s) of day students vape in each hotspot. This type of hotspot analysis can help school personnel identify previously undetected hotspots for student e-cigarette use so they can be addressed. This approach will also help school personnel determine where efforts have been successful so available resources can be focused on those areas where opportunities for improvement still exist. In my experience, students can often identify places to engage in prohibited behaviors, even in schools with highly robust student supervision and student safety efforts. Just as importantly, it has been my experience that this technique is a powerful tool to not only identify "hotspots" but to effectively address them through measures such as moving technology, increasing live supervision, and the use of tools like "Walking Only" and "No Go" zones during specific time periods.

f. The use of scripted and/or audio scenarios to measure how well school employees understand how to apply policies, procedures, and technology that has been implemented to help prevent and address student e-cigarette use

In my experience, it is very common for school staff who have been provided with a school district policy to have difficulty applying the policy under actual field conditions. For example, I often find that school staff who have been given a written policy on mandatory child abuse reporting and who have completed a training program on the policy do not know how to properly respond to a scenario depicting an incident which requires staff to notify law enforcement and/or social services as required by statute. I have found this to be true in most school districts when it comes to reporting of threats of violence made by students, bullying, and situations where there are indications that a student is at increased risk of self-harm. As student e-cigarette use is a type of concerning behavior, it is not surprising to me that there is often a disconnect between a school district policy prohibiting possession or use of e-cigarettes, pods, and associated paraphernalia and the ability of staff to understand how to apply the policy under "real-world" conditions in a school.

One method that will help SFUSD more effectively measure how well school personnel understand and consistently apply the district's e-cigarette policy is to periodically conduct scenario simulations with staff to see if they are able to apply the policy correctly to the situations they are presented with. In this activity, a staff member is presented with a scenario related to e-cigarette violations and asked to articulate the actions they would initiate for the hypothetical event. I suggest this activity be done as a timed activity with a set time allotted for staff to respond to each scenario. For example, the staff is told that they have one minute to respond to each scenario. The responses from the participants are used to gauge how well the school district has prepared their personnel to understand and apply the policy to prevent and address e-cigarette use by students.

Like the other approaches in this section, the use of scenarios for fidelity testing does not require a great deal of time but it can provide one of the most accurate ways to measure how well staff can apply

policies, practices, use technologies, and other important aspects of this comprehensive approach. In my experience, school officials can readily create and properly utilize both scripted and audio scenarios of this type as well as reasonably accurate scoring tools for each scenario.

While SFUSD has been utilizing some of the above approaches, the District has not had the staffing nor technology needed to allow for such an extensive combination of measurement and testing. In my experience, the additional personnel, technologies, and recommended practices will make it possible and practical for the District to measure, test, and evaluate the effectiveness of the recommended strategy as well as to detect and address gaps in the strategy to further tailor and improve it based on local conditions and challenges.